

*Please provide the following information, and submit to the NOAA DM Plan Repository.*

**Reference to Master DM Plan (if applicable)**

*As stated in Section IV, Requirement 1.3, DM Plans may be hierarchical. If this DM Plan inherits provisions from a higher-level DM Plan already submitted to the Repository, then this more-specific Plan only needs to provide information that differs from what was provided in the Master DM Plan.*

URL of higher-level DM Plan (if any) as submitted to DM Plan Repository:

**1. General Description of Data to be Managed****1.1. Name of the Data, data collection Project, or data-producing Program:**

C-CAP Land Cover Change, Commonwealth of the Northern Mariana Islands (CNMI),  
Guguan, 2004 - 2016

**1.2. Summary description of the data:**

This data set contains the 2004 and 2016 classifications of Guguan, CNMI and can be used to analyze change. This data set utilized 2 full WorldView2 and Quickbird multispectral scenes and the 2004 high-resolution Guguan C-CAP data set, which were analyzed according to the Coastal Change Analysis Program (C-CAP) protocol to determine land cover.

**1.3. Is this a one-time data collection, or an ongoing series of measurements?**

One-time data collection

**1.4. Actual or planned temporal coverage of the data:**

2004-01-08 to 2016-02-08

**1.5. Actual or planned geographic coverage of the data:**

W: 145.827223, E: 145.856094, N: 17.324907, S: 17.293226

**1.6. Type(s) of data:**

*(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)*  
Image (digital)

**1.7. Data collection method(s):**

*(e.g., satellite, airplane, unmanned aerial system, radar, weather station, moored buoy, research vessel, autonomous underwater vehicle, animal tagging, manual surveys, enforcement activities, numerical model, etc.)*

**1.8. If data are from a NOAA Observing System of Record, indicate name of system:****1.8.1. If data are from another observing system, please specify:**

**2. Point of Contact for this Data Management Plan (author or maintainer)****2.1. Name:**

NOAA Office for Coastal Management (NOAA/OCM)

**2.2. Title:**

Metadata Contact

**2.3. Affiliation or facility:**

NOAA Office for Coastal Management (NOAA/OCM)

**2.4. E-mail address:**

coastal.info@noaa.gov

**2.5. Phone number:**

(843) 740-1202

**3. Responsible Party for Data Management**

*Program Managers, or their designee, shall be responsible for assuring the proper management of the data produced by their Program. Please indicate the responsible party below.*

**3.1. Name:****3.2. Title:**

Data Steward

**4. Resources**

*Programs must identify resources within their own budget for managing the data they produce.*

**4.1. Have resources for management of these data been identified?****4.2. Approximate percentage of the budget for these data devoted to data management (specify percentage or "unknown"):****5. Data Lineage and Quality**

*NOAA has issued Information Quality Guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of information which it disseminates.*

**5.1. Processing workflow of the data from collection or acquisition to making it publicly accessible**

*(describe or provide URL of description):*

Process Steps:

- 2020-06-30 00:00:00 - This dataset was created by NOAA's Ocean Service, Office for Coastal Management (OCM). This dataset contains the classifications of 2004 imagery and 2016 imagery. It is used for change analysis between these years. The

attributes include a from-to change description category. There are 481 classes corresponding to the 481 possible from-to change combinations. In this section of the metadata, the 2005 classification procedure is described, then the 2016 change detection classification procedure is described. Finally in the post-processing section, the process of combining the maps to generate a spatial matrix of change is discussed.

**Early Date (2004) Classification:** This dataset was created by Sanborn ([www.sanborn.com](http://www.sanborn.com)). This version of the classification is the High Resolution Land Cover (2004-era) for the Island of Guguan, CNMI. This section outlines the classification procedure for the Guguan, CNMI High Resolution C-CAP. This island has no man-made impervious surfaces, thus an impervious layer was not created. The mapping approach utilized a boundary summary and refinement procedure developed by Sanborn to leverage previous United States Forest Service mapping efforts to create the high resolution land cover data set. A calibration visit was conducted and training data was collected for classification. Non impervious features were mapped using a 0.5 acre minimum mapping unit (MMU).

**Pre-processing steps:** The Quickbird mosaic utilized for this project was provided from Digital Globe as an orthorectified, georeferenced product and was consistent with the quoted 1:12000 spatial accuracy.

**Field-Collected Data:** Training data was collected in the field between March 14th and 27th, 2008. Land cover observations were recorded by analysts. The referenced dataset went through a QA/QC procedure to ensure it met accuracy standards.

**Classification: Segmentation -** Image segmentation was completed at multiple scales using the multispectral (2.4 m) imagery in order to group like spectral and textural objects within the imagery. For consistency, the associated impervious data set was incorporated into the segmentation layer as a boundary delimiter. Segments can share boundaries of an impervious surface, but can never overlap an impervious surface. Automated Classification, Image segments are classified using a decision tree classifier in See5 software and an iterative nearest neighbor classifier in Definiens software. Nearest neighbor training data is collected through analyst interpretation or ancillary data sets and used to calibrate the classification algorithm.

**Automated Classification Refinement -** Models are built to refine or reclassify land cover areas by utilizing the wealth of attribute information linked to each segment within Definiens.

**- 2020-06-30 00:00:00 - Classification Edits -** As with any automated or semi-automated land cover classification there are often inconsistencies in the land cover map. The final step before map finalization was to remove inaccuracies through manual segment labeling as interpreted by an analyst.

**Map Finalization -** Sanborn used independent reviewer's comments to further refine the land cover map. Attributes for this product are as follows:

- 0 Background
- 1 Unclassified
- 2 Impervious
- 3 4 5 Developed, Open Space
- 6 Cultivated Crops
- 7 Pasture/Hay
- 8 Grassland/Herbaceous
- 9 Deciduous Forest
- 10 Evergreen Forest
- 11 Mixed Forest
- 12 Scrub/Shrub
- 13 Palustrine Forested Wetland
- 14 Palustrine Scrub/Shrub Wetland
- 15 Palustrine Emergent Wetland
- 16 Estuarine Forested Wetland
- 17 Estuarine Scrub/Shrub Wetland
- 18 Estuarine Emergent Wetland
- 19 Unconsolidated

Shore 20 Bare Land 21 Open Water 22 Palustrine Aquatic Bed Late Date (2016) Classification: This section outlines the classification procedure for the Island of Guguan, CNMI High Resolution C-CAP. Non impervious features were mapped using a 0.5 acre minimum mapping unit (MMU). Pre-processing steps: The Worldview-2 mosaic utilized for this project was provided from United States Department of Agriculture, Natural Resources Conservation Service as an orthorectified, georeferenced product. Classification: Segmentation - Image segmentation was completed at multiple scales using the multispectral (2.4 m) imagery in order to group like spectral and textural objects within the imagery. For consistency with previous land cover mapping efforts, the generation of objects was partially constrained by the 2004 NOAA Guguan C-CAP land cover product. Classification- The image segments from the 2016 Worldview-2 imagery were overlaid on imagery and analysts conducted a visual analysis to identify areas of change. Map Finalization - NOAA OCM performed two rounds of internal product review. Reviewer comments were incorporated to further refine the final land cover product. Attributes for this product are as follows: 0 Background 1 Unclassified 2 Impervious 3 4 5 Developed, Open Space 6 Cultivated Crops 7 Pasture/Hay 8 Grassland/Herbaceous 9 Deciduous Forest 10 Evergreen Forest 11 Mixed Forest 12 Scrub/Shrub 13 Palustrine Forested Wetland 14 Palustrine Scrub/Shrub Wetland 15 Palustrine Emergent Wetland 16 Estuarine Forested Wetland 17 Estuarine Scrub/Shrub Wetland 18 Estuarine Emergent Wetland 19 Unconsolidated Shore 20 Bare Land 21 Open Water 22 Palustrine Aquatic Bed Post-Processing Steps: A GIS matrix algorithm was run with 2004 and 2016 datasets as inputs. The algorithm generates a from-to file where each combination is uniquely labeled from 1 to 481.

**5.1.1. If data at different stages of the workflow, or products derived from these data, are subject to a separate data management plan, provide reference to other plan:**

**5.2. Quality control procedures employed (describe or provide URL of description):**

## 6. Data Documentation

*The EDMC Data Documentation Procedural Directive requires that NOAA data be well documented, specifies the use of ISO 19115 and related standards for documentation of new data, and provides links to resources and tools for metadata creation and validation.*

**6.1. Does metadata comply with EDMC Data Documentation directive?**

No

**6.1.1. If metadata are non-existent or non-compliant, please explain:**

Missing/invalid information:

- 1.7. Data collection method(s)

- 3.1. Responsible Party for Data Management
- 4.1. Have resources for management of these data been identified?
- 4.2. Approximate percentage of the budget for these data devoted to data management
- 5.2. Quality control procedures employed
- 7.1. Do these data comply with the Data Access directive?
  - 7.1.1. If data are not available or has limitations, has a Waiver been filed?
  - 7.1.2. If there are limitations to data access, describe how data are protected
- 7.3. Data access methods or services offered
- 7.4. Approximate delay between data collection and dissemination
- 8.1. Actual or planned long-term data archive location
- 8.3. Approximate delay between data collection and submission to an archive facility
- 8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?

**6.2. Name of organization or facility providing metadata hosting:**

NMFS Office of Science and Technology

**6.2.1. If service is needed for metadata hosting, please indicate:**

**6.3. URL of metadata folder or data catalog, if known:**

<https://www.fisheries.noaa.gov/inport/item/60205>

**6.4. Process for producing and maintaining metadata**

*(describe or provide URL of description):*

Metadata produced and maintained in accordance with the NOAA Data Documentation Procedural Directive: [https://nosc.noaa.gov/EDMC/DAARWG/docs/EDMC\\_PD-Data\\_Documentation\\_v1.pdf](https://nosc.noaa.gov/EDMC/DAARWG/docs/EDMC_PD-Data_Documentation_v1.pdf)

## **7. Data Access**

*NAO 212-15 states that access to environmental data may only be restricted when distribution is explicitly limited by law, regulation, policy (such as those applicable to personally identifiable information or protected critical infrastructure information or proprietary trade information) or by security requirements. The EDMC Data Access Procedural Directive contains specific guidance, recommends the use of open-standard, interoperable, non-proprietary web services, provides information about resources and tools to enable data access, and includes a Waiver to be submitted to justify any approach other than full, unrestricted public access.*

**7.1. Do these data comply with the Data Access directive?**

**7.1.1. If the data are not to be made available to the public at all, or with limitations, has a Waiver (Appendix A of Data Access directive) been filed?**

**7.1.2. If there are limitations to public data access, describe how data are protected**

**from unauthorized access or disclosure:**

**7.2. Name of organization of facility providing data access:**

NOAA Office for Coastal Management (NOAA/OCM)

**7.2.1. If data hosting service is needed, please indicate:**

**7.2.2. URL of data access service, if known:**

**7.3. Data access methods or services offered:**

**7.4. Approximate delay between data collection and dissemination:**

**7.4.1. If delay is longer than latency of automated processing, indicate under what authority data access is delayed:**

**8. Data Preservation and Protection**

*The NOAA Procedure for Scientific Records Appraisal and Archive Approval describes how to identify, appraise and decide what scientific records are to be preserved in a NOAA archive.*

**8.1. Actual or planned long-term data archive location:**

*(Specify NCEI-MD, NCEI-CO, NCEI-NC, NCEI-MS, World Data Center (WDC) facility, Other, To Be Determined, Unable to Archive, or No Archiving Intended)*

**8.1.1. If World Data Center or Other, specify:**

**8.1.2. If To Be Determined, Unable to Archive or No Archiving Intended, explain:**

**8.2. Data storage facility prior to being sent to an archive facility (if any):**

Office for Coastal Management - Charleston, SC

**8.3. Approximate delay between data collection and submission to an archive facility:**

**8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?**

*Discuss data back-up, disaster recovery/contingency planning, and off-site data storage relevant to the data collection*

**9. Additional Line Office or Staff Office Questions**

*Line and Staff Offices may extend this template by inserting additional questions in this section.*